



Nicholas G. Campins
ncampins@sherleff.com
415.348.8300 x202

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August 20, 2009

Via Email & Hand Delivery

Hon. Shira A. Scheindlin
United States District Judge
U.S. District Court, Southern District of New York
500 Pearl Street
New York, New York 10007

Re: *City of New York v. Amerada Hess, et al.*, 04 CV 3417 (SDNY)
In re MTBE Products Liability Litigation, MDL 1358
Phase 3 Legal Issues Raised At Yesterday's Conference

Dear Judge Scheindlin:

The City of New York ("the City") writes to address the following legal issues raised at yesterday's conference regarding Phase 3: (1) what statutes and regulations apply to treatment of water below the MCL; (2) the relevance of ExxonMobil's statutory violations to the City's public nuisance claim; (3) whether ExxonMobil had notice of the City's negligence-related claim that ExxonMobil failed to use reasonable care by failing to ensure that station owners and others properly stored or dispensed gasoline containing MTBE and (4) ExxonMobil's duty to warn water providers and others about the dangers of gasoline containing MTBE.

1. Treatment of Contamination Below the MCL

There are several statutory and regulatory standards applicable to treatment of contamination below the MCL. *First*, New York City Administrative Code Section 24-302 provides, in pertinent part:

Commissioner of environmental protection; duty in regard to sources of water supply and property of department.

It shall be the duty of the commissioner to preserve the purity of all waters from which any part of the city water supply is drawn, and to protect such supply and the lands adjacent thereto from injury or nuisance.

N.Y.C. Admin. Code § 24-302 (emphasis added). The word "purity" in Section 24-302 in turn should be construed in accordance with its plain meaning. *See Puello v. BCIS*, 511 F.3d 324, 327 (2d Cir. 2007). Purity is commonly understood as meaning "freedom from anything that debases, contaminates, pollutes, etc." *See* "purity," Dictionary.com Unabridged Dictionary (Retrieved May 25, 2009), *see* Exhibit A. The City therefore has a legal right to keep its water

free of contaminants. N.Y.C. Admin. Code § 24-302.¹

Second, state regulations require the City to monitor and treat contamination even in instances where contamination is present below the MCL where there are any “deleterious changes in raw water quality”:

(a) Whenever the supplier of water determines or is advised by the State that one or more of the MCLs set forth in this Subpart are *or may be exceeded; . . . or that any deleterious changes in raw water quality have occurred; or that a change in the character of the . . . or aquifer has been observed which may affect water quality; or that any combination of the preceding exists, the supplier of water shall notify the State and do the following:*

(1) undertake a study to determine the cause or causes of such conditions, independent of known or anticipated treatment technology;

(2) modify existing or install treatment to comply, to the extent practicable, with sections 5-1.30, 5-1.50, 5-1.51 and 5-1.60 of this Subpart;

(3) initiate water sampling as needed to delineate the extent and nature of the cause of concern;

(4) investigate all or part of the watershed or aquifer to verify any existing or potential changes in the character of the sources of water supply; . . .

N.Y. Comp. Codes R. & Regs. tit. 10, § 5-1.12 (emphasis added); *see also* N.Y. Comp. Codes R. & Regs. tit. 10, § 5-1.71 (duty to prevent contamination).² *Third*, because it provides drinking water to the public, the City has a particular interest in providing potable water, for example water that does not have an offensive taste and odor and that is not contaminated with VOCs like MTBE. *See* N.Y. Comp. Codes R. & Regs. tit. 10, § 170.3 (defining potable water); *see also* N.Y. Comp. Codes R. &

¹ The historical context of this statute is discussed in *People v. Van Buren*, 4 N.Y.3d 640 (2005). In that case, the Court of Appeals explained: “[T]he Legislature eventually decided that permanent protection of the City’s infrastructure was necessary, but that the cost of such protection would be borne by the City. In 1937, the Legislature imposed upon the Commissioner of the DEP “the duty . . . to preserve the purity of all waters from which any part of the city water supply is drawn, and to protect such supply and the lands adjacent thereto from injury or nuisance . . . [and] preserve . . . all other property connected with the water supply.” *Id.*, 4 N.Y.3d at 645.

² The four regulations referenced in Section 5-1.12(a)(2) relate to treatment and water quality standards. Section 5-1.30 details certain minimum treatment requirements. Sections 5-1.50 and 5-1.51 discuss the applicability of MCLs, set forth MCLs (by reference) and address compliance with MCLs. Section 5-1.60 relates to monitoring of disinfection byproducts in surface water systems or groundwater systems under the direct influence of surface water and is not directly relevant to this litigation. *See* N.Y. Comp. Codes R. & Regs. tit. 10, §§ 5-1.30, 5-150, 5-151, 5-160.

Regs. tit. 10, § 40-2.160 (every public water system shall provide “a safe, adequate and aesthetically pleasing supply of water for drinking and other domestic uses”). As the Court has held, the level at which MTBE affects the aesthetic acceptability of drinking water requires a “fact-specific” inquiry. *In re MTBE*, 593 F.Supp.2d 549, 551-53 (S.D.N.Y. 2008).

Finally, once treatment has been placed on a well, NYSDOH regulations specify that “[i]n all cases, public exposure to organic contamination must be *minimized*,” and that “[w]here treatment is proposed, best available technology shall be provided to reduce organic contaminants to the *lowest practical levels*.” N.Y. Comp. Codes R. & Regs. tit. 10, §§ 5-1.22, 5-6.5 (incorporating by reference “Recommended Standards for Water Works, 2003 Edition” (Ten States 2003) (emphasis added)) (attached for convenience as **Exhibit B**).

2. ExxonMobil had Fair Notice that the City Would Assert Statutory Violations As Part of Its Public Nuisance Claim

Statutory violations are relevant to a municipality’s public nuisance claim because, upon a showing that a defendant has violated a statute, the plaintiff need not show “injury to the public” to obtain injunctive relief. *See Incorporated Village of Freeport*, 556 N.Y.S.2d at 152 (“no special injury or damage to the public need be alleged, and the commission of the prohibited act is sufficient to warrant granting the injunction”); *City of New York*, 499 N.Y.S.2d at 1013 (same); *City of New York v. Casbar, Nicobel LLC*, 2009 WL 1026593, *2 (N.Y. Sup. April 15, 2009) (holding that where conduct “violates a statutory scheme designed to protect the public health, that the conduct constitutes a violation and may be considered a public nuisance subject to the Administrative Code” “relief may be granted without a demonstration of special damages or injury to the public. The proof of the violation alone is sufficient grounds for the issuance of injunctive relief”); *Shore Realty Corp.*, 759 F.2d at 1051 (violations of N.Y. Envtl. Conserv. Law §§ 27-0913(1), 27-0914(1) and 27-0914(2) constituted public nuisance per se).

Here, the City intends to show that ExxonMobil violated applicable statutes. For example, the City will show that ExxonMobil’s conduct is illegal pursuant to New York City Administrative Code Section 17-142, which defines “nuisance:”

The word "nuisance", shall be held to embrace public nuisance, as known at common law or in equity jurisprudence; whatever is dangerous to human life or detrimental to health; whatever building or erection, or part or cellar thereof, is overcrowded with occupants, or is not provided with adequate ingress and egress to and from the same or the apartments thereof, or is not sufficiently supported, ventilated, sewerred, drained, cleaned or lighted in reference to its intended or actual use; and whatever renders the air or human food or drink, unwholesome. All such nuisances are hereby declared illegal.

Id. (emphasis added). The City will likewise show that ExxonMobil violated New York City Administrative Code Section 24-303, which provides:

- a. It shall be unlawful for any person to throw or deposit, or cause to be thrown or

deposited any dead animal or other offensive matter or anything whatever in either of the reservoirs or in any lake, pond or stream, or in any aqueduct or pipe from or through which the water supply of the city shall be drawn.

Id. Finally, the City will show that ExxonMobil illegally discharged petroleum in violation of New York Navigation Law Section 173. *See id.* (“discharge of petroleum is prohibited”); *see also* N.Y. Navig. § 172 (defining “Discharge”); *id.* (defining “Petroleum”). Proof of each of these statutory violations is relevant to the City’s public nuisance claim.

Finally, ExxonMobil was on fair notice of such claims pursuant to Federal Rule of Civil Procedure 8. Here, the New York Navigation Law was specifically pleaded, New York City Administrative Code Section 17-142 is a statute defining “nuisance” and New York City Administrative Code Section 24-303 is a criminal statute defining duties relevant to public nuisance. ExxonMobil therefore had sufficient notice of the nature of the City’s public nuisance claim pursuant to Rule 8. *See Wynder v. McMahon*, 360 F.3d 73, 79 (2d Cir. 2004) (“we defined fair notice as that which will enable the adverse party to answer and prepare for trial, allow the application of res judicata, and identify the nature of the case so that it may be assigned the proper form of trial.”) (citing cases); *see also id.* (citing *Salahuddin v. Cuomo*, 861 F.2d 40, 42 (2d Cir. 1988)) (fair notice is judged by whether the complaint enables defendants “to answer and prepare for trial”). In the alternative, in the event that the Court were to find the alleged statutory violations are inadequately pleaded, the City requests that the Court exercise its authority pursuant to Federal Rule of Civil Procedure 15(b)(1) and allow the City to amend the pleadings accordingly. *See Fisher v. Vassar College*, 66 F.3d 379, 408 (2d Cir. 1995) (“Fed. R. Civ. P. 15(b) allows a party to amend its pleadings to conform to the proof received into evidence. The decision of whether to allow such an amendment is left to the discretion of the district court judge.”)

3. ExxonMobil had Fair Notice Of the City’s Negligence Claim Asserting Liability for Conduct At ExxonMobil Owned Stations

ExxonMobil is correct that – as part of its negligence claim -- the City did not specifically plead that ExxonMobil failed to use reasonable care by failing to ensure that station owners and others properly stored or dispensed gasoline containing MTBE. However, the City should nonetheless be allowed to pursue this theory, because ExxonMobil was on notice that City would seek to prove that it failed to use reasonable care by failing to ensure that station owners and others properly stored or dispensed gasoline containing MTBE of its liability theory. Specifically, the City pleaded a Navigation Law claim which this Court has held requires direct spiller liability. *See In re MTBE*, 591 F.Supp.2d 259, 282 n. 111 (SDNY 2008) (quoting *State of New York v. Montayne*, 604 N.Y.S.2d 978, 978 (App. Div. 1993) (to be held liable as a discharger of petroleum products, there must be proof that the manufacturer or refiner “was in a position to prevent the discharge or effect a cleanup”). ExxonMobil was therefore on “fair notice” that enabled it “to answer and prepare for trial,” and such that it will “allow the application of res judicata, and identify the nature of the case so that it may be assigned the proper form of trial” and as such, pursuant to Federal Rule of Civil Procedure 8 the Complaint should be read as stating a claim for negligence against ExxonMobil for failing to use reasonable care by failing to

ensure that station owners and others properly stored or dispensed gasoline containing MTBE. See *Wynder*, 360 F.3d at 79.

In the alternative, if the Court were to find that the pleading in the Fourth Amended Complaint is inadequate on this matter, the Court should exercise its authority pursuant to Federal Rule of Civil Procedure 15(b)(1), which provides:

(1) Based on an Objection at Trial. If, at trial, a party objects that evidence is not within the issues raised in the pleadings, the court may permit the pleadings to be amended. The court should freely permit an amendment when doing so will aid in presenting the merits and the objecting party fails to satisfy the court that the evidence would prejudice that party's action or defense on the merits. The court may grant a continuance to enable the objecting party to meet the evidence.

Id. Allowing such amendment will aid in the presentation of the merits, and the Court should exercise its discretion to freely permit it. See *Fisher*, 66 F.3d at 408. Similarly, there is no prejudice, where, as here, ExxonMobil is on notice of the Navigation Law claim which requires substantially similar, if not identical proof to a negligence claim asserting that ExxonMobil failed to use reasonable care by failing to ensure that station owners and others properly stored or dispensed gasoline containing MTBE.

4. The Nature of the Warnings and to Whom They Should Be Given is a Fact Question for the Jury

New York law concerning the need to warn persons or entities other than the user is far less constrained than ExxonMobil makes it out to be. Instead, “the nature of the warning to be given and to whom it should be given likewise turn upon a number of factors, including the harm that may result from use of the product without notice, the reliability and any possible adverse interest of the person, *if other than the user*, to whom notice is given, the burden on the manufacturer or vendor involved in locating the persons to whom notice is required to be given, the attention which it can be expected a notice in the form given will receive from the recipient, the kind of product involved and the number manufactured or sold, and the steps taken, other than the giving of notice, to correct the problem.” *Cover v. Cohen*, 61 N.Y.2d 261, 276 (1984) (emphasis added); see also *Liriano v. Hobart Corp.*, 92 N.Y.2d 232, 240 (N.Y. 1998) (“This Court has also recognized that, in certain circumstances, a manufacturer may have a duty to warn of dangers associated with the use of its product even after it has been sold”). Accordingly, “generally, the issue will be one of fact for the jury whose function will be to assess the reasonableness of the steps taken by the manufacturer or vendor in light of the evidence concerning the factors listed above.” *Cover*, 61 N.Y.2d at 276-77; see also *Liriano v. Hobart Corp.*, 92 N.Y.2d at 240 (“Such a duty will generally arise where a defect or danger is revealed by user operation and brought to the attention of the manufacturer; the existence and scope of such a duty are generally fact-specific.”). Here, the jury should be allowed to assess whether ExxonMobil should have warned water providers and other entities that were not direct users of gasoline containing MTBE, but who may have been nonetheless injured through the use of gasoline containing MTBE.

The case cited by ExxonMobil, *Berg v. Underwood's Hair Adaption Process, Inc.*, 751 F.2d 136, 137 (2d Cir. 1984), is easily distinguished. As an initial matter, that case did not cite nor even consider the New York Court of Appeals decision in the *Cover* case cited above. Instead, it relied on decisions in matters related to the same series of transactions and occurrences as the case and on the extraordinary nature of the facts in the case in which “Plaintiffs were injured by a bizarre and deliberate abuse by a licensed medical practitioner of a nonmedical commercial product.” *Id.* at 137. The issue there was whether the manufacturer of certain fibers had a duty to foresee that it would be misused as hair implants on fraud victims and whether it had a concomitant duty to warn against this misuse. *Id.* In contrast, the injury to persons and entities other than users is a direct result of the intended use of the product – gasoline containing MTBE. *Berg* is plainly distinguishable on its face.

Accordingly, ExxonMobil’s interpretation of the law is simply incorrect and the City should be allowed to pursue its claim that ExxonMobil failed to warn water providers (including the City) and others who were likely to be injured by the intended use of gasoline containing MTBE.

Conclusion

We look forward to discussing these issues with Your Honor. Please contact me if the Court requires any additional information. The City appreciates Your Honor’s attention to these matters.

Respectfully submitted,

/S/ NICHOLAS G. CAMPINS

Nicholas G. Campins

Cc: All Counsel via LNFS & Email



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Exhibit A



purity

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pu-ri-ty [pyoo r-i-tee] [Show IPA](#)**-noun**

- the condition or quality of being pure; freedom from anything that debases, contaminates, pollutes, etc.: *the purity of drinking water.*
- freedom from any admixture or modifying addition.
- ceremonial or ritual cleanness.
- freedom from guilt or evil; innocence.
- physical chastity; virginity.
- freedom from foreign or inappropriate elements; careful correctness: *purity of expression.*
- Optics.* the chroma, saturation, or degree of freedom from white of a given color.
- cleanness or spotlessness, as of garments.

Origin:1175-1225; < LL *pūritās* (see **PURE**, **-ITY**); r. ME *pur(e)te* < AF < LL, as above

Dictionary.com Unabridged

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pureness, innocence, sinlessness, honor, honour

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n.

- The quality or condition of being pure.
- A quantitative assessment of homogeneity or uniformity.
- Freedom from sin or guilt; innocence; chastity: "*Teach your children . . . the belief in purity of body, mind and soul*" (Emmeline Pankhurst).
- The absence in speech or writing of slang or other elements deemed inappropriate to good style.
- The degree to which a color is free from being mixed with other colors.

The American Heritage® Dictionary of the English Language, Fourth Edition

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[Cite This Source](#)**Purity**

Pu"ri-ty\, n. [OE. *purete*, *purte*, OF. *purt*['e], F. *puret*['e], from L. *puritas*, fr. *purus* pure. See **Pure**.] The condition of being pure. Specifically: (a) freedom from foreign admixture or deleterious matter; as, the purity of water, of wine, of drugs, of metals. (b) Cleanness; freedom from foulness or dirt. "The purity of a linen vesture." --Holyday. (c) Freedom from guilt or the defilement of sin; innocence; chastity; as, purity of heart or of life. (d) Freedom from any sinister or improper motives or views. (e) Freedom from foreign idioms, or from barbarous or improper words or phrases; as, purity of style.

Webster's Revised Unabridged Dictionary, © 1996, 1998 MICRA, Inc.

[Cite This Source](#)**purity**

c.1225, from O.Fr. *purete*, earlier *purte* (12c.), from L.L. *puritatem* (nom. *puritas*) "cleanness, pureness," from L. *purus* (see **pure**).

Online Etymology Dictionary, © 2001 Douglas Harper

[Cite This Source](#)Main Entry: **pu-ri-ty**

Pronunciation: 'pyur-&t-E

Function: *noun*

: the quality or state of being pure

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Exhibit B

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For Water Works**

2003 Edition

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of Plans and Specifications for Public Water Supplies

A Report of the Water Supply Committee of the
Great Lakes--Upper Mississippi River Board
of State and Provincial Public Health and Environmental Managers

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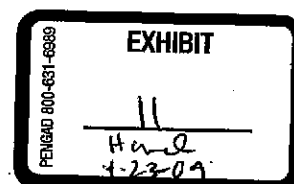
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FOREWORD

The Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers in 1950 created a Water Supply Committee consisting of one associate from each state represented on the Board. A representative from the Province of Ontario was added in 1978. Throughout this document the term state shall mean a representative state or the Province of Ontario. The Committee was assigned the responsibility for reviewing existing water works practices, policies, and procedures, and reporting its findings to the

Board. The report of the Water Supply Committee was first published in 1953, and subsequently has been revised and published in 1962, 1968, 1976, 1982, 1987, 1992, 1997, and 2003.

This document includes the following:

1. Policy Statements - Preceding the standards are policy statements of the Board concerning water works design, practice, or resource protection. Some policy statements recommend an approach to the investigation of innovative treatment processes which have not been included as part of the standards because sufficient confirmation has not yet been documented to allow the establishment of specific limitations or design parameters. Other policy statements recommend approaches, alternatives or considerations in addressing a specific water supply issue and may not develop into standards.
2. Interim Standards - Following the policy statements are interim standards. The interim standards give design criteria which are currently being used for new treatment processes, but the use of the criteria is limited and insufficient for recognition as a recommended standard.
3. Recommended Standards - The Standards, consisting of proven technology, are intended to serve as a guide in the design and preparation of plans and specifications for public water supply systems, to suggest limiting values for items upon which an evaluation of such plans and specifications may be made by the reviewing authority, and to establish, as far as practicable, uniformity of practice. Because statutory requirements and legal authority pertaining to public water supplies are not uniform among the states, and since conditions and administrative procedures and policies also differ, the use of these standards must be adjusted to these variations.

The terms shall and must are used where practice is sufficiently standardized to permit specific delineation of requirements or where safeguarding of the public health justifies such definite action. Other terms, such as should, recommended, and preferred, indicate desirable procedures or methods, with deviations subject to individual consideration.

Most quantified items in this document are cited in US customary units and are rounded off at two significant figures. Metric equivalent quantities, also rounded off at two significant figures, follow in brackets where compound units are involved. The metric unit symbols follow

International System conventions. In the event of a conflict between quantities in US units and the metric equivalent the quantity in US units shall take precedence.

It is not possible to cover recently developed processes and equipment in a publication of this type. However, the policy is to encourage, rather than obstruct, the development of new processes and equipment. Recent developments may be acceptable to individual states if they meet at least one of the following conditions: 1) have been thoroughly tested in full scale comparable installations under competent supervision, 2) have been thoroughly tested as a pilot plant operated for a sufficient time to indicate satisfactory performance, or 3) a performance bond or other acceptable arrangement has been made so the owners or official custodians are adequately protected financially or otherwise in case of failure of the process or equipment.

The Board recognizes that many states, other than those of the Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, utilize this publication as part of their design requirements for water works facilities. The Board welcomes this practice as long as credit is given to the Board and to this publication as a source for the standards adopted. Suggestions from non-member states are welcome and will be considered.

Adopted April, 1997.

POLICY STATEMENT ON PRE-ENGINEERED WATER TREATMENT PLANTS

Pre-engineered water treatment plants are becoming available and being used for production of potable water at public water systems. Many applications being proposed are for small systems having relatively clean surface water sources which are now being required to provide filtration under the federal Safe Drinking Water Act.

Pre-engineered water treatment plants are normally modular process units which are pre-designed for specific process applications and flow rates and purchased as a package. Multiple units may be installed in parallel to accommodate larger flows.

Pre-engineered treatment plants have numerous applications but are especially applicable at small systems where conventional treatment may not be cost effective. As with any design the proposed treatment

must fit the situation and assure a continuous supply of safe drinking water for water consumers. The reviewing authority may accept proposals for pre-engineered water treatment plants on a case by case basis where they have been demonstrated to be effective in treating the source water being used.

Factors to be considered include:

1. Raw water quality characteristics under normal and worst case conditions. Seasonal fluctuations must be evaluated and considered in the design.
2. Demonstration of treatment effectiveness under all raw water conditions and system flow demands. This demonstration may be on-site pilot or full scale testing or testing off-site where the source water is of similar quality. On-site testing is required at sites having questionable water quality or applicability of the treatment process. The proposed demonstration project must be approved by the reviewing authority prior to starting.
3. Sophistication of equipment. The reliability and experience record of the proposed treatment equipment and controls must be evaluated.
4. Unit process flexibility which allows for optimization of treatment.
5. Operational oversight that is necessary. At surface water sources full-time operators are necessary, except where the reviewing authority has approved an automation plan. See Policy Statement on Automated/Unattended Operation of Surface Water Treatment Plants.
6. Third party certification or approvals such as National Sanitation Foundation (NSF) for a) treatment equipment and b) materials that will be in contact with the water.
7. Suitable pretreatment based on raw water quality and the pilot study or other demonstration of treatment effectiveness.
8. Factory testing of controls and process equipment prior to shipment.
9. Automated troubleshooting capability built into the control system.

10. Start-up and follow-up training and troubleshooting to be provided by the manufacturer or contractor.

11. Operation and maintenance manual. This manual must provide a description of the treatment, control and pumping equipment, necessary maintenance and schedule, and a troubleshooting guide for typical problems.

12. On-site and contractual laboratory capability. The on-site testing must include all required continuous and daily testing as specified by the reviewing authority. Contract testing may be considered for other parameters.

13. Manufacturers warranty and replacement guarantee. Appropriate safeguards for the water supplier must be included in contract documents. The reviewing authority may consider interim or conditional project approvals for innovative technology where there is sufficient demonstration of treatment effectiveness and contract provisions to protect the water supplier should the treatment not perform as claimed.

14. Water supplier revenue and budget for continuing operations, maintenance and equipment replacement in the future.

Additional information on this topic is given in the State Alternative Technology Approval Protocol dated June, 1996 which was developed by the Association of State Drinking Water Administrators, U.S. Environmental Protection Agency and various industry groups.

Adopted April, 1997

POLICY STATEMENT ON CONTROL OF ORGANIC CONTAMINATION FOR PUBLIC WATER SUPPLIES

Although standards and advisories for organics are being developed, there have been numerous cases of organic contamination of public water supply sources. In all cases, public exposure to organic contamination must be minimized. There is insufficient experience to establish design standards which would apply to all situations. Controlling organic contamination is an area of design that requires pilot studies and early consultation with the reviewing authority. Where treatment is proposed, best available technology shall be provided to

reduce organic contaminants to the lowest practical levels. Operations and monitoring must also be considered in selecting the best alternative. The following alternatives may be applicable:

1. Alternate Source Development
2. Existing Treatment Modifications
3. Air Stripping For Volatile Organics (See 4.5.4 Packed Tower Aeration)
4. Granular Activated Carbon

Consideration should be given to:

- a. using contact units rather than replacing a portion of existing filter media;
- b. series and parallel flow piping configurations to minimize the effect of breakthrough without reliance on continuous monitoring;
- c. providing at least two units. Where only two units are provided, each shall be capable of meeting the plant design capacity (normally the projected maximum daily demand) at the approved rate. Where more than two units are provided, the contactors shall be capable of meeting the design capacity at the approved rate with one or more (as determined in conjunction with the reviewing authority) units removed from service;
- d. using virgin carbon; this is the preferred media. Although reactivated carbon may eventually present an economic advantage at large water treatment plants, such an alternative may be pursued only with the preliminary endorsement of the reviewing authority. Regenerated carbon using only carbon previously used for potable water treatment can be used for this purpose. Transportation and regeneration facilities must not have been used for carbon put to any other use;
- e. acceptable means of spent carbon disposal.

Except for temporary, emergency treatment conditions, particular attention should be given to developing an engineering report which, in addition to the normal determinations, includes the following:

1. For organic contaminants found in surface water sources:

- a. type of organic chemicals, sources, concentration, frequency of occurrence, water pollution abatement schedule, etc.,
- b. possible existing treatment plant modifications to lower organic chemical levels. Results of bench, pilot or full scale testing demonstrating treatment alternatives, effectiveness and costs,
- c. a determination of the quality and/or operational parameters which serve as the best measurement of treatment performance, and a corresponding monitoring and process control program.

2. For organic contamination found in groundwater sources:

- a. types of organic chemicals, sources, concentration, estimate of residence time within the aquifer, plume delineation, flow characteristics, water pollution abatement schedule, etc.,
- b. results of bench or pilot studies demonstrating treatment alternatives, effectiveness, and costs,
- c. a determination of the quality and/or operational parameters which serve as the best measure of treatment performance, and a corresponding monitoring and process control program,
- d. development and implementation of a wellhead protection plan.

The collection of this type of data is often complicated and lengthy. Permanent engineering solutions will take significant time to develop. The cost of organic analyses and the availability of acceptable laboratories may further complicate both pilot work and actual operation.

Alternative source development or purchase of water from nearby unaffected systems may be a more expedient solution for contaminated groundwater sources.

Adopted April, 1987
Revised April, 1991
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TREATMENT

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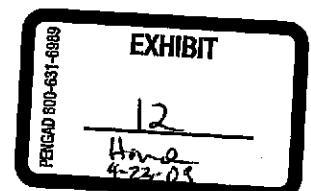
4.0 GENERAL

The design of treatment processes and devices shall depend on evaluation of the nature and quality of the particular water to be treated, seasonal variations, the desired quality of the finished water and the mode of operation planned.

4.1 CLARIFICATION

Plants designed to include clarification for processing surface water shall

- a. provide a minimum of two units each for rapid mix, flocculation and sedimentation,
- b. permit operation of the units either in series or parallel where softening is performed and *should* permit series or parallel operation where plain clarification is performed,
- c. be constructed to permit units to be taken out of service without disrupting operation, and with drains or pumps sized to allow dewatering in a reasonable period of time,
- d. provide multiple-stage treatment facilities when required by the reviewing authority,
- e. be started manually following shutdown,



concrete must be coated with a non-leaching protective coating which is compatible with salt and brine.

4.4.2.19 Housing

Bagged salt and Dry bulk salt storage shall be enclosed and separated from other operating areas in order to prevent damage to equipment.

4.4.3 Water quality test equipment

Test equipment for alkalinity, total hardness, carbon dioxide content, and pH should be provided to determine treatment effectiveness.

4.5 AERATION

Aeration may be used to help remove offensive tastes and odors due to dissolved gases from decomposing organic matter, or to reduce or remove objectionable amounts of carbon dioxide, hydrogen sulfide, etc., and to introduce oxygen to assist in iron and/or manganese removal. The packed tower aeration process is an aeration process applicable to removal of volatile organic contaminants.

4.5.1 Natural draft aeration

Design shall provide

- a. perforations in the distribution pan 3/16 to 1/2 inches in diameter, spaced 1 to 3 inches on centers to maintain a six inch water depth,
- b. for distribution of water uniformly over the top tray,
- c. discharge through a series of three or more trays with separation of trays not less than 12 inches,
- d. loading at a rate of 1 to 5 gallons per minute for each square foot of total tray area (2.5 - 12.5 m/hr),
- e. trays with slotted, heavy wire (1/2 inch openings) mesh or perforated bottoms,
- f. construction of durable material resistant to aggressiveness of the water and dissolved gases,

g. protection from loss of spray water by wind carriage by enclosure with louvers sloped to the inside at an angle of approximately 45 degrees,

h. protection from insects by 24-mesh screen.

4.5.2 Forced or induced draft aeration

Devices shall be designed to

a. include a blower with a weatherproof motor in a tight housing and screened enclosure,

b. insure adequate counter current of air through the enclosed aerator column,

c. exhaust air directly to the outside atmosphere,

d. include a down-turned and 24-mesh screened air outlet and inlet,

e. be such that air introduced in the column shall be as free from obnoxious fumes, dust, and dirt as possible,

f. be such that sections of the aerator can be easily reached or removed for maintenance of the interior or installed in a separate aerator room,

g. provide loading at a rate of 1 to 5 gallons per minute for each square foot of total tray area(2.5 - 12.5 m/hr),

h. insure that the water outlet is adequately sealed to prevent unwarranted loss of air,

i. discharge through a series of five or more trays with separation of trays not less than six inches or as approved by the reviewing authority,

j. provide distribution of water uniformly over the top tray,

k. be of durable material resistant to the aggressiveness of the water and dissolved gases.

4.5.3 Spray aeration

Design shall provide

- a. a hydraulic head of between 5 - 25 feet,
- b. nozzles, with the size, number, and spacing of the nozzles being dependent on the flowrate, space, and the amount of head available,
- c. nozzle diameters in the range of 1 to 1.5 inches to minimize clogging,
- d. an enclosed basin to contain the spray. Any openings for ventilation, etc. must be protected with a 24-mesh screen.

4.5.4 Pressure aeration

Pressure aeration may be used for oxidation purposes only if pilot plant study indicates the method is applicable; it is not acceptable for removal of dissolved gases. Filters following pressure aeration must have adequate exhaust devices for release of air. Pressure aeration devices shall be designed to

- a. give thorough mixing of compressed air with water being treated,
- b. provide screened and filtered air, free of obnoxious fumes, dust, dirt and other contaminants.

4.5.5 Packed tower aeration

Packed tower aeration (PTA) which is also known as air stripping involves passing water down through a column of packing material while pumping air counter-currently up through the packing. PTA is used for the removal of volatile organic chemicals, trihalomethanes, carbon dioxide, and radon. Generally, PTA is feasible for compounds with a Henry's Constant greater than 100 (expressed in atm mol/mol) - at 12EC), but not normally feasible for removing compounds with a Henry's Constant less than 10. For values between 10 and 100, PTA may be feasible but should be extensively evaluated using pilot studies. Values for Henry's Constant should be discussed with the reviewing agency prior to final design.

4.5.5.1 Process design

- a. Process design methods for PTA involve the determination of Henry's Constant for the contaminant, the mass transfer coefficient, air pressure drop and stripping factor. The applicant shall provide justification for the design parameters selected (i.e. height and

diameter of unit, air to water ratio, packing depth, surface loading rate, etc.). Pilot plant testing may be required.

The pilot test shall evaluate a variety of loading rates and air to water ratios at the peak contaminant concentration. Special consideration should be given to removal efficiencies when multiple contaminations occur. Where there is considerable past performance data on the contaminant to be treated and there is a concentration level similar to previous projects, the reviewing authority may approve the process design based on use of appropriate calculations without pilot testing. Proposals of this type must be discussed with the reviewing authority prior to submission of any permit applications.

b. The tower shall be designed to reduce contaminants to below the maximum contaminant level (MCL) and to the lowest practical level.

c. The ratio of the column diameter to packing diameter should be at least 7:1 for the pilot unit and at least 10:1 for the full scale tower. The type and size of the packing used in the full scale unit shall be the same as that used in the pilot work.

d. The minimum volumetric air to water ratio at peak water flow should be 25:1. The maximum air to water ratio for which credit will be given is 80:1.

e. The design should consider potential fouling problems from calcium carbonate and iron precipitation and from bacterial growth. It may be necessary to provide pretreatment. Disinfection capability shall be provided prior to and after PTA.

f. The effects of temperature should be considered since a drop in water temperature can result in a drop in contaminant removal efficiency.

g. Redundant capacity may be required by the reviewing authority.

4.5.5.2 Materials of construction

a. The tower can be constructed of stainless steel, concrete, aluminum, fiberglass or plastic. Uncoated carbon steel is not recommended because of corrosion. Towers constructed of light-weight materials should be provided with adequate support to prevent damage from wind.